

SUSTAINING A BALANCE IN FOREST MANAGEMENT

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CANADA
A FOREST NATION

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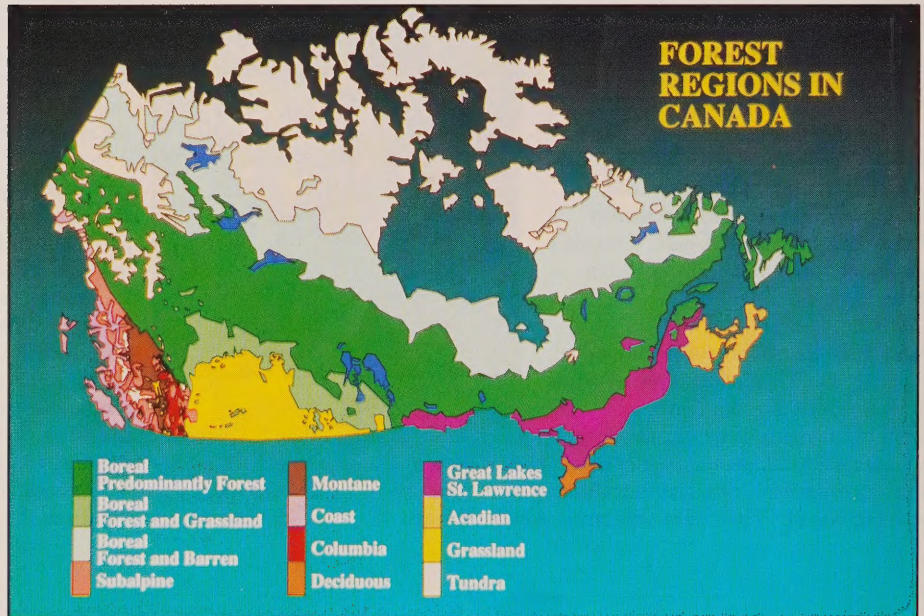
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Generally, the provinces provide rights to private companies to harvest on government land. Rights are granted to timber, but not to the land, water, wildlife or recreation resources. These rights involve specific reforestation and harvesting responsibilities which are monitored by the provinces and which are subject to review at usually short-term intervals.

The responsibilities of the federal government include trade relations, market development, management of federal land, regulation of pesticides, monitoring of atmospheric pollution, forestry research, scientific exchanges and technology transfer. Many of these responsibilities are shared with the provinces.

Canada sees the forest resource as the very heart of the sustainable future which must be, as the United Nations Brundtland World Commission on the Environment and Development showed almost five years ago, the anchor of world-wide development from now on. We see a resource that must and can be sustained. We see concerns that must be addressed in cooperation with all stakeholders in the context of environmentally sound management. Canada sees a need to further reconcile the different values that different people place on the forests. The economic realities are here and will never go away. We see national imperatives of employment and prosperity that we can never ignore.

Diversity is the key
to forestry in Canada.



The various competing demands made on the forests must be carefully considered when priorities are set in this, a forest nation. In a world of many different viewpoints and realities, some things are incontestable. One of them is the extent to which the landscape, including the forests, has helped to shape the very heart and soul of Canada. Trees and forests, after all, were one of the reasons why many Europeans came to the New World in the first place. They are a reason why people remained here to work the land and they are a fundamental reason why the nation has prospered and why we have become who we are. No wonder Canadians take so seriously the management of their forests.

Heirs to the third-largest forested expanse in the world, Canadians have grown accustomed to a landscape that seems, with overwhelming predominance, to be formed of trees. More than half the country -- 453 million hectares -- is covered with trees, giving Canada one tenth of the world's forests.

Few countries rely more heavily on the forests for economic and social well-being than does Canada. Almost 900,000 Canadians are employed either directly in the forest industry or by companies that support it, and approximately 350 communities owe their very existence to nearby forests. The forest industry accounts for 26 percent of the manufacturing sector in Canada with investments averaging \$6.3 billion annually. The forest sector pays out more than \$8 billion in annual wages. In addition,

Canadian forests support a multi-billion dollar tourism and recreation industry.

As compelling as these figures are, there is more to Canada's reliance on the forests than can be demonstrated through statistics and ledger sheets. There is, in this forest nation, a love of the land and the woods that permeates literature and all culture, and that underlies the national mystique that binds together a diverse and scattered population.

This association between the people and the land goes beyond practicalities, even esoteric practicalities. The people of Canada know that they are stewards of a crucial link between the land and the welfare of the globe. They know that the forests are vital to the planet's life-support system and are a priceless gene pool of plant and animal life that is fundamental to the biological processes on which human existence depends.

Canadians know and appreciate the value of a white-tailed deer swiftly bounding across a clearing no less than they appreciate the value of exporting a shipload of lumber. This knowledge brings with it immense responsibility.

The values which people around the world place on their forests have changed dramatically in recent years. Where public concern and government policy used to be geared primarily to timber supply for industry, today a host of values and demands come into play. Government policies are



Forest management practices in Canada must reflect the values inherent to the Canadian reality, a complex mix of sometimes competing values and demands.

changing to reflect these evolving values and demands. Today, the forests must be managed not just for commercial timber supply, but for fish and wildlife, for watersheds, recreation and biodiversity.

Forest management practices in Canada now take an ecosystem approach, a more holistic view of the forest, recognizing that it is much more than trees, and that each of the constituent elements must be nurtured and preserved if the integrity of the whole is to be maintained.

Consistent with this vision, Canada embraces the concept of sustainable development where the use of resources must be in the best interest of today's population while not endangering the needs and requirements of future generations.

The forest industry provides employment, directly or indirectly, to almost 900,000 Canadians and no fewer than 350 communities owe their very existence to nearby forests.



MEETING THE CHALLENGE

FOREST CONSERVATION

Canada has acknowledged the importance of preserving its forest ecodiversity, including old-growth, through the creation of a network of 34 national parks which, once the system is fully completed, will represent all 39 natural terrestrial areas found in the country. The country's *Green Plan for a Healthy Environment* aims at the completion of the system by the end of the decade.

Already, more than 31 million hectares within Canada's forests regions are in conservation areas, including national and provincial parks. This represents the highest per capita accumulation of protected natural areas in the world, and Canada is committed to extending this to 12 percent of the country, consistent with the findings of the Brundtland Commission.

Canada has a network of parks and wilderness areas established to preserve the habitats of species, unique ecosystems and samples representative of ecosystems.

There are more than 3,300 protected sites across the country, including ecological reserves, natural areas, wildlife parks, wilderness areas, national or provincial parks, and birds sanctuaries. The preservation of these areas will contribute to the maintenance of the gene pool and of ecodiversity and ensure that representative segments of the Canadian forests are available for the satisfaction of all the values associated with the forests.



Canada's perspective on old-growth forests recognizes the intrinsic value of preserving representative stands of all forest ecosystems, old-growth included. Sustainable development and common sense further require a recognition that old-growth forests provide two benefits:

they are cherished monuments to the past and a source of economic wealth. Trees can live a very long time and there is something very human and understandable in the way people venerate old things. Finding the balance between these conflicting demands is the challenge that all of us face.

There is no universally accepted definition of what constitutes old-growth forests. In the province of British Columbia, stands of 500 year-old Sitka spruce trees clearly qualify as very old-growth, while in Central Canada, 140 year-old pines may constitute old-growth in a different ecological context.

Canada recognizes that some old-growth areas ought never to be touched for a variety of important reasons. It also acknowledges that trees do not live forever. Many of the trees in Canada which qualify by most standards as old-growth, are also mature or overmature and are potential victims of fire, insect infestation or disease. Industry, naturally, requires some of these trees, as an important part of their timber supply, and will be dependent upon their harvesting until many second-growth forests reach maturity. This transition will likely take decades.

Environmentalists' concerns about old-growth may be no less valid than economic and practical considerations. In fact, the governments in Canada are addressing both.

The ecological importance of old-growth to species diversity is under research, from a multi-disciplinary perspective. More research will add to the understanding of this complex subject and to the extent to which old-growth forests contribute to species diversity.

A number of provinces have developed a review of their old-growth forests to better ensure that public and stakeholder demands

for increased conservation are seriously considered in integrated planning. Canada's view of old-growth forests is to balance their environmental and ecological value with economic and commercial concerns in the context of sustainable development.

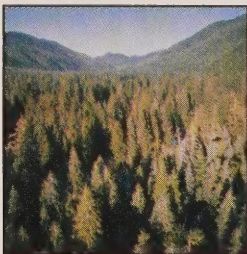
FOREST PROTECTION

Because of the expanse and general remoteness of Canadian forests, damage from insect, disease, encroaching vegetation and fire is more difficult to control than in many countries with a smaller and closer resource base and denser population. Even though Canada produces some of the world's best aerial- and ground-based forest protection systems, millions of cubic metres of wood are lost every year.

Fire is the largest contributor to forest losses. Its sources are both natural and man-made. In Canada there were more than 9,000 forest fires during 1990. Their detection and suppression represents one of the largest mobilizations of human and technical resources in fire fighting anywhere in the world.

For these reasons, Canada has become an innovator in this field. For example, it is one of the largest exporters of water bombers which help to save forest areas in Europe and the developing world. A number of provinces use new computer technology in advanced fire management. These advanced systems incorporate a multitude of field-generated data in predicting the number and location of fires.

Already, over 31 million hectares within Canada's forest regions are in conservation areas. This represents the highest per capita accumulation of designated natural sites in the world.



Competing vegetation (weeds and brush) that too often hampers the successful and quick re-establishment of the forest is another major problem. Canada has become a pioneer in developing state-of-the-art herbicides (weed killers) which have an unparalleled level of safety. The current elimination of their use -- a goal for some -- would in the Canadian context, make it unfeasible to replant and tend many harvested areas, especially in remoter areas. However, research continues into finding new approaches to controlling encroaching vegetation. This will further increase the already wide margin of environmental safety of these applications.

As well, millions of hectares of forest have been lost to pests such as the budworm and bark beetle. Without protection, losses might have been larger and other, non-timber values, such as recreation or wildlife habitat might have suffered. In response to public concerns, the forest sector has increased the use of biological agents. Canada has developed, on a technical and commercial basis, the wide use of *Bacillus thuringiensis* (B.t.), a biological insecticide, as an alternative to chemically-based insecticides.

The use of forest pesticides, whether they be chemical or biological, is strictly controlled in Canada. Only after thorough research and a rigorous review process coordinated by the federal government are pesticides approved for use. Permits for use are only granted for application on specific types of sites and under certain conditions to ensure absolute safety.

Canada will continue to build upon its strength in forest protection as well as to assist developing and developed countries by sharing its technical and scientific knowledge. Canadian forest protection technology and know-how have proven to be key in sustaining the forest resources of the world.



Canada is one of the largest exporters of water bombers which help to save countless forest areas in Europe and the developing world.

BIODIVERSITY

Although trees are obviously the main and most visible component of the forest, Canada's forests also sustain a diversity of plants, animals, insects and microorganisms that are unique in this country and which must be preserved. Many of these life forms are already in parks, conservation areas or other protected environments, while some are in areas which are subject to harvest.

Canada recognizes the importance of maintaining the diversity of ecosystems and the wealth of genetic material each contains. It also acknowledges that some of these systems, though resilient, are fragile and forest management practices must recognize this.

Canada has developed reforestation policies that ensure the long-term health and preservation of living organisms and gene pools and that give nature a helping hand where natural regeneration does not quickly occur. The key to these policies is to rely on natural regeneration for the renewal of more than half of our harvested forest land and, on the remainder, to plant seedlings grown from seeds collected primarily from trees growing in wilderness. Where planting is necessary, there continues to be a growing emphasis on using a broad genetic representation. Natural regeneration mimics somewhat natural distribution patterns of forest stands and helps ensure that the regenerated forest reflects what the area is capable of producing.

Canada has pledged to establish a national tree genetics center to ensure the preservation of the domestic forest resource, and a national network of ecological forest reserves. The country is a signatory of the Convention on International Trade in Endangered Species of Wild Flora and Fauna. It has participated in the formation of a World Convention on Biodiversity and is committed to a new Wildlife and Plant Protection Act. Canada is also taking a leadership role in helping to formulate an international agreement on forests. These measures will further Canada's environmental commitment which envisions biodiversity as one of the key components of sustainable development.



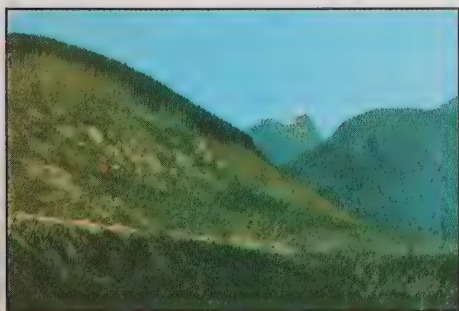
In reforesting harvested land, we rely on natural regeneration for the renewal of more than half of our harvested forest land and, on the remainder, to plant seedlings grown from seeds collected primarily from wild populations.



HARVESTING

Few of the concerns raised by Canadians create as much attention as the issue of clearcuts. Clearcutting -- the harvesting of trees on a given tract of land by removing them all -- may have a definitely negative visual impact. Valid concerns are also raised about the effects of clearcuts on wildlife and the local ecology.

As noted by a recent publication of a British Columbia inquiry into forest management, "To suggest that any particular harvesting system is all good or bad, fails to take into consideration many interdependent factors." Past experience in boreal forest nations, for example, indicates that where clearcutting is not applied on the many sites where it is required, the net result is to downgrade future generation of trees.

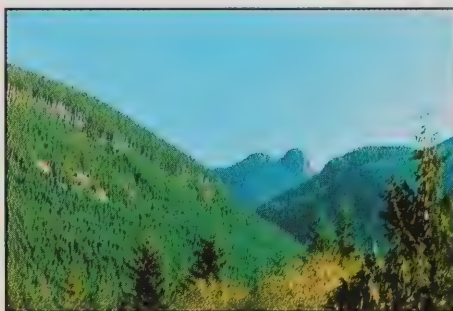


This photo of a clearcut area in British Columbia was taken in 1957.

The forest industry relies on clearcuts because they are cost-effective and a safe method for workers. They also use clearcutting because much of the Canadian forest, is mature, over-mature or even-aged and many species must receive large amounts of light if they are to vigorously regenerate.

Canada recognizes that improper clearcut harvesting or negligence can lead to soil erosion and threaten wildlife and fisheries as well as biodiversity and the visual appeal of the forest. There remains a consensus among most foresters and forest managers that if practised properly, clearcutting can replicate the natural life cycle of the forest.

New regulations and guidelines in many provincial jurisdictions are resulting in the wiser use of clearcutting including the reduction of the maximum size of the cut-over areas. By current law or regulation, all cut over areas on public lands must be satisfactorily reforested.



This is how it looks today.

There remains a consensus amongst most foresters that if practised properly, clearcutting can replicate the natural life-cycle of the forest.



Canada's timber supply indicated that nationally, the resource can sustain the present level of industrial activity on a long-term basis.

It is important to note that clearcutting is only one of several harvesting methods used in Canada. In certain areas, techniques such as shelterwood cutting are applied but with narrower and smaller openings. For example, shelterwood cutting tends to be used more in mixed forests and in locations where natural regeneration potential is extremely high. In selection harvesting, usually older trees are taken from stands containing trees of different ages, opening the stands and allowing the remaining trees to receive more light, moisture and nutrients. New Canadian computer innovations are helping with the landscape design and shaping of cutovers to ensure that they better blend with the natural terrain.

Clearcutting is, and will remain, an approved method for harvesting, salvaging and renewing certain forests in Canada. At the same time, Canada continues to refine its harvesting techniques guided by the principles of sustainable development and landscape conservation. Canada is increasing research on harvesting techniques with the goal of further developing more tailored approaches for the benefit of all forest values.

REFORESTATION AND WOOD SUPPLY

Forest regeneration -- the replacing of trees in an area harvested to ensure both the sustainability of the resource and the long-term economic health of the myriad forest

industries from which Canada and its foreign customers benefit -- is also a subject of concern.

There is no denying either the demands made by industry on the forests of Canada or the economic importance of that industry.

The regeneration of harvested forests varies somewhat from jurisdiction to jurisdiction. Canada believes that the forests must be regenerated at least at the rate they are harvested.

The average annual tree harvest nationally represents approximately 1 million hectares or only 0.4 percent of the country's productive forest land base. Canada's planting record shows a tripling of the area planted and a four-fold increase in the number of trees planted between 1975 and 1990. In Canada, one billion trees are now planted annually which means that two trees are planted for every one cut. A recent study showed that the net growing volume of Canada's forest has increased by 693 million cubic metres or 2.5% from 1976 to 1986.

Sustainable development, however, requires that we do better still. Canada is a leader in research into practical methods of enhancing successful natural and artificial forest regeneration. For example, "variable chlorophyll fluorescence techniques" developed by Canadian university researchers improve the quality and survival of forest nursery seedlings. Combined with enhanced regeneration technologies, systems are now in

place to monitor and ensure the overall success of regeneration efforts.

Ensuring a long-term wood supply sufficient to maintain industrial growth, as well as maintaining Canada's leadership role in the delivery of forest products to world markets, depends on the regeneration for use tomorrow of the areas harvested today.

Assessments of the viability of Canada's timber supply indicate that nationally the resource can sustain the present level of industrial activity on a long-term basis, although there may be regional or local variances. Reductions in allowable cuts may be mandated in certain areas. Canadian scientific advances in satellite technology, computer mapping and forest modelling, provide improved information on all forest values. This, combined with better utilization standards and new harvesting technology, make some forests previously considered economically inaccessible now viable for harvest. Advances in processing technology will increase the amount of lumber and fibre that can be obtained from each tree.

One of the difficulties is that in many regions there is an uneven distribution of age classes, with a skew to the older and over-mature

categories. This necessitates, in the short term, the cutting of older forests if the current timber supply is not to be significantly decreased. Over time, and with more intensive forest management, there will be a more even balance between younger and mature forests.

The success of sustainability depends heavily on formulating strategies that will maintain the productivity of the forests and reconcile the conflicting demands made on them. In

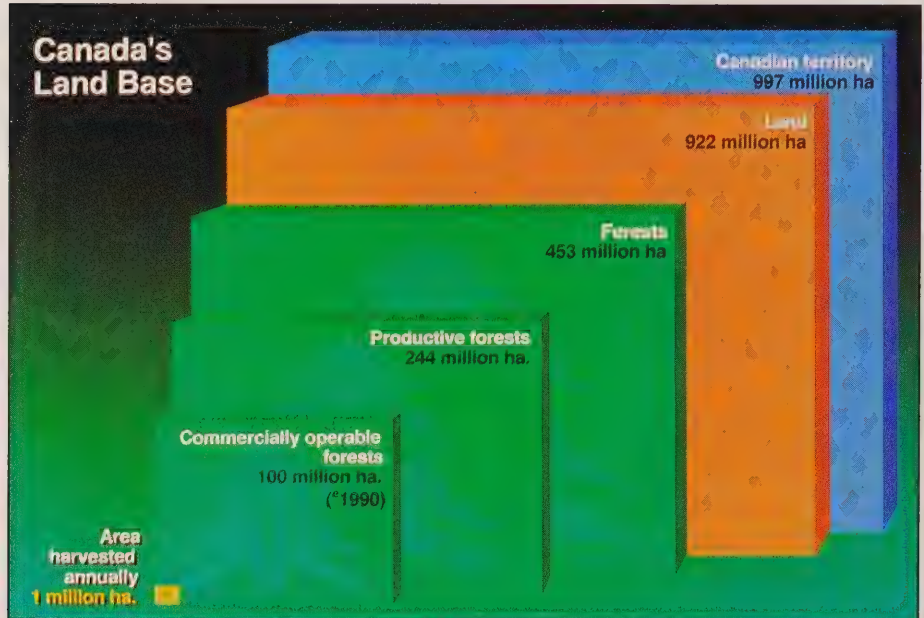


Canada's planting record shows a fourfold increase in the numbers of trees planted between 1975 and 1990.

the long term, assessing the different demands placed on the forest resource and the resource's capacity to replenish itself either naturally or through artificial means is a complex exercise. It is clear, however, that with effective management techniques geared to the different problems encountered in different areas, Canada can look forward to continued economic benefits from the forest resource.

The 1987 National Forest Sector Strategy for Canada signalled an expanding commitment to forest management, including forest renewal and intensive silviculture, and called on all jurisdictions involved to promote forest resource development programs that would ensure Canada's long-term wood supply.

The annual tree harvest nationally represents approximately 1 million hectares or only 0.4% of the country's productive forest land base.



THE TASK AHEAD

Little today is as it was twenty or even ten years ago. Forest values and attitudes have changed. The demands that Canadians place on their forests and the price they are willing to pay for their economic development have changed radically. There is, today, an awareness of the fragility of ecosystems and of the importance of environmental integrity which is unique to the latter part of the twentieth century.

Canadian forestry practices and forest management policies, always at the leading edge of contemporary wisdom and the state of the scientific art, have changed too, in keeping with the pace of public perceptions and developing knowledge.

Forests, in Canada and elsewhere, used to be only managed for timber. Today they must be managed holistically, in recognition of the fact that a forest is much more than trees and that all the myriad parts of the ecosystem are fundamental to the integrity of the whole. Regeneration and

the preservation of biodiversity are more important than ever. Greater numbers of trees are planted to replace those harvested. They are tended and nurtured in more efficient ways and, as a result, more of them survive. But above all, there is a recognition in today's forest management practices of the crucial importance of ecosystems.



Canada has instituted integrated resource management for more than a decade.

Most forests will continue to be assessed and managed for the values they bring to Canadians and to the world. Whether in the case of water, fish, wildlife, recreation, tourism, range, heritage, biodiversity or timber considerations, the planning process will increasingly take these important -- sometimes competing -- values into account. Canadian forests, because of their breadth, have always had a large, multi-user character. Modern day pressures will simply sharpen that inherent

focus and ongoing research and development will provide additional tools for achieving beneficial results. The goal must be to satisfy the maximum number of stakeholders and



users, everyone from conservationists to timber companies. Fortunately, Canada has expansive forest areas still intact and the ability as a young, outward-looking country, to learn from others and to keep abreast of developments throughout the world. With Canada's proven track record as an innovator in the field of forest management practices, the potential remains to meet the forest challenge.

"The challenge of the 1990s is formidable," Jules Dufour, professor of humanities at the Université du Québec, writes in a recent book entitled *Resource Management and Development*.

"Will it be possible to reconcile the interests of the forest industry, which is increasingly trans-national, with those of other forest users?" he asks. "Will the communities that depend on the forest for their livelihood be able to survive and even prosper? Will we be able to restore those environments which have been degraded by industrial waste water? Will we succeed in completing the national park network and creating enough protected areas to ensure diversity and durability in each of Canada's major biogeographical units?"

These are all important questions. They describe the magnitude of the task ahead and the weight of the responsibility. The Government of Canada believes we have, or are developing, the resources, skills and attitudes to meet that challenge. We have the will and we have the tools.

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British Columbia Ministry of Forests

Public Affairs Branch

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Forest Management Division

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Yukon Territory Dept. of Renewable Resources

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